

## CLAIMS

1. Method of detecting a plurality  $K$  of symbols ( $d_k(i)$ ) transmitted by or for a plurality  $K$  of users from a received signal, each symbol of a user belonging to a modulation constellation, the detection method using a lattice of points ( $\Xi$ ) generated by the said modulation constellations, the said plurality of symbols of the different users being represented by a point amongst a subset of points in the said lattice, the said constellation and the received signal being represented by a point characteristic of this signal, referred to as the received point, translated from a point in the said constellation by a noise vector ( $\mathbf{n}$ ), characterised in that it comprises a step of orthogonal projection of the received point onto an affine subspace, referred to as a projection subspace, parallel to or merged with an affine subspace delimiting the said constellation, and a step of seeking the closest neighbour to the point thus projected amongst the points in the said constellation.
2. Detection method according to Claim 1, characterised in that the said affine subspace delimiting the constellation is determined according to the position of the received point with respect to the said constellation.
3. Detection method according to Claim 2, characterised in that the search for the closest neighbour is limited to the points in the constellation belonging to a sphere centred on the said projected point.
4. Detection method according to Claim 1 or 2, characterised in that, the affine projection subspace being merged with an affine subspace delimiting the constellation, the search for the closest neighbour is effected amongst the points in the constellation belonging to the said affine subspace.
5. Detection method according to Claim 4, characterised in that the search for the closest neighbour is limited to the points in the affine subspace belonging to a sphere of the said subspace centred on the said projected point.

6. Detection method according to one of the preceding claims, characterised in that the projection step is performed only if the received point is remote from the said constellation by more than a predetermined distance.

- 5           7. Detection method according to one of the preceding claims, characterised in that, the symbols of each user being the subject of a multiplication by a signature of this user before being transmitted over a transmission channel, the coordinates of the received point are obtained by a step of adapted filtering of the received signal, the filtering being adapted to the transmission channels and to the signatures of the
- 10           different users.

8. Reception device for a DS-CDMA telecommunication system, comprising a detection device adapted to implement the detection method according to one of the preceding claims.

- 15           9. Reception device for an MC-CDMA telecommunication system, comprising a detection device adapted to implement the detection method according to one of Claims 1 to 7.